ABSTRACT OF THE DISCLOSURE

A tracker system for determining the relative position between a sensor and an object surface, generally comprising a sensor or sensors for detecting a pattern of fiducials disposed on an object surface and a processor connected to the at least one sensor. An augmented reality system generally comprising a pattern of fiducials disposed on an object surface, a computer having a processor and a memory, a user interface for receiving input and presenting augmented reality output to a user, and a tracker for detecting the pattern of fiducials. A method for tracking the position and orientation of an object generally comprising the steps of scanning across an object to detect fiducials and form video runs, clumping video runs to detect a pattern of fiducials, acquiring estimated values for a set of tracking parameters by comparing a detected pattern of fiducials to a reference pattern of fiducials, and iterating the estimated values for the set of tracking parameters until the detected pattern of fiducials match the reference pattern of fiducials to within a desired convergence. A method for augmenting reality generally comprising the steps of disposing a pattern of fiducials on an object surface, tracking the position and orientation of the object, retrieving and processing virtual information stored in a computer memory according to the position and orientation of the object and presenting the virtual information with real information to a user in near real time.